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October 13, 1970

Attention: John C.

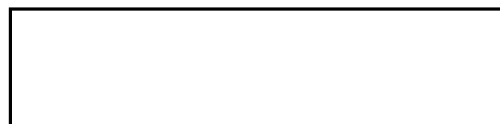
Dear John:

Enclosed for your files are three (3) copies of
Activity Summary, 2201201-AS-16.

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Sincerely,



Senior Staff Scientist

PSC/j
Enclosures (3)

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ATTACHMENTS

Declassification Review by NGA/DoD

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October 13, 1970

ACTIVITY SUMMARY

To: John C.

From: [REDACTED]

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Subject: Contract Visit to Customer Facility
[REDACTED] 5500-6076) 70R

Date(s): October 6, 7, 8, 1970

Reference: [REDACTED] 2201201-AS-16

On October 6, 7, 8, 1970, [REDACTED] from [REDACTED]

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[REDACTED] visited the Image Technology Laboratory
under Contract [REDACTED]

[REDACTED] was present at the lab on 8 October for purposes of presenting a discussion on analytical work performed under this program in the partially coherent image manipulator. During this trip the first day was applied to the laboratory effort in which resolution test targets were used as input to the optical manipulating system. The second day, of which about one-half was applied to technology discussions with Major Hayden P., also included a review of the previous days results and a discussion of the projected laboratory effort. The third day, Thursday, consisted of a briefing presented by [REDACTED] on the subject of analytical analysis of the partially coherent optical system as applied to the image manipulation program. Present at this briefing were Major Hayden P., Hank C., [REDACTED] Frank F. and [REDACTED] were present during a portion of the briefing, primarily concerning discussions on the general technological approach being taken and the organization to meet the program goals.

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The details of the laboratory effort are written up in the laboratory notebook. The Program Plan written to describe the immediate goals and implementation methods is attached to this Activity Summary. The next visit under this program is scheduled for the week of 19 October.

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To John C.

25X1 From

Subject Program Plan

Performance Schedule
Completion by 20 Oct, 1970

Reference: - Activity Summary for 6-8 Oct, 1970.

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Oct. 7, 1978^{25X1}

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Program Plan

To place in context the immediate objectives of the optical processing program of image manipulation of "low contrast" imagery, the following outline is provided.

1. Present objectives are to build up filters, procedures and system configuration to provide manipulation flexibility to enhance "low contrast" imagery. This task requires enhancement of contrast and of high frequency components of the imagery. This portion of the program is being performed with laboratory generated test imagery and CORN target imagery. Improvement of the resolution target imagery can be substantiated by visual observation of output on optical system and by

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measurement of tri-bar contrast and resolution.

2. Ultimate objectives are to apply developed technology to continuous tone reconnaissance imagery. In general one finds that most imagery of this type is affected by a ^{taking} frequency response that falls off with increasing frequency in a "Gaussian" manner. This is because of a conglomerate of limiting frequency responses, including atmospheric, system, camera and other physical affects. By enhancing high frequency components of an image spectrum, and boosting contrast, it is expected that operational imagery can be enhanced for information extraction. The demonstration of this approach for continuous

tone imagery should be available by December, 1970. Preliminary evaluation can be performed on these initial results.

In summary, the direction that is projected for the coming three months will continue to apply amplitude filters and source controls to modify the partially coherent optical manipulator for image enhancement. The imagery that will be studied include the present test targets, and soon continuous-tone imagery. The objective is to demonstrate optical image manipulation capability for enhancement of operational type "low contrast" imagery.

Immediate requirements

1. Determine resolution capability of optical processor. Maintain input imagery below this limit of resolution to ensure the output is not system limited.
2. Obtain a process for a high resolution film to record the output of the system without itself affecting the output resolution.
3. Repeat the CORN target using only the better filters (as determined from results on 6, 7 Oct., 1970).
Do for 4mm. and 6mm. dia. filters.
4. Obtain illumination distribution in filter plane and use for input to plot system response. (25X1 will provide these with data made available.)

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curves to CORN target response to determine significant parameters that provide optimum enhancement.

5. Fabricate filters $1.2 < D < 2.0$, at about ~~xxx~~ 1.4, ~~x~~ 1.6, and 1.8.

Test with test targets.

6. Select continuous tone imagery.

Try to get a minimum of four samples for image enhancement.

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